[SPECIFICATION]

[TITLE OF THE INVENTION]

METHOD OF GENERATING DIGITAL ITEM FOR ELECTRONIC COMMERCIAL TRANSACTION

[BRIEF DESCRIPTION OF THE DRAWINGS]

The invention will be described in detail with reference to the following drawings in which like reference numerals refer to like elements wherein:

FIG. 1 is a view showing a data structure of Digital Item definition model according to the present invention;

FIG. 2 is a view representing Digital Item definition model of the present invention as EBNF; and

FIG. 3 is a view showing one example of component elements of Digital Items according to the present invention.

[DETAILED DESCRIPTION OF THE PRESENT INVENTION]

[OBJECT OF THE PRESENT INVENTION]

[FIELD OF THE INVENTION AND DESCRIPTION OF THE RELATED ART]

The present invention relates to the defining of Digital Item as the unit of manipulation of data for electronic commercial transaction including creation, mining, transaction, transfer, management, storage, consumption, etc., of multimedia data.

The present invention defines Digital Item as the unit of manipulation of data for the electronic commercial transaction. Particularly, the present invention defines Digital Item unit of manipulation of multimedia data in creation, mining, transaction, transfer, management, storage, consumption, etc., of multimedia data for the electronic commercial transaction.

For performing activities associated with the electronic commercial transaction

including creation, mining, transaction, transfer, management, storage, consumption, etc., of multimedia data, there arises a need of flexibility, consistency, and compatibility rule in connection with the unit of manipulation of multimedia.

Particularly, in the light of a trend of the increase of the electronic commercial transaction due to the development of Internet, absence of definition model for the unit of manipulation of multimedia data for the electronic commercial transaction invites potential causes invoking disturbance in the electronic commercial transaction.

According to this, considering at maximum role relations among all users (referring to all subjects associated with business models of the electronic commercial transaction, including Digital Item creators, providers, distributors, consumers, intellectual property exercisers, industrial property exercisers, financial service provider, electronic commercial transaction supervisors, etc.) of the electronic commercial transaction business models, MPEG-21 in ISO/IEC SC29/WG11 specifies Digital Item definition model and efforts have been made for adopting an international standard according to which Digital Items have flexibility, consistency, and compatibility based on the subjects of the electronic commercial transaction or the association of the subjects with element techniques .

Accordingly, considering the subjects for building business models of the electronic commercial transaction or the association of the subjects with element techniques, it is required to provide definition model of Digital Item such that the electronic commercial transaction is accomplished regardless of different types of networks and terminals.

Such a Digital Item definition model has to have compatibility, consistency and flexibility as the minimal unit of multimedia data in the electronic commercial transaction including creation, mining, transaction, transfer, management, storage, consumption, etc., of multimedia data required for the electronic commercial transaction.

[TECHNICAL OBJECT OF THE INVENTION]

It is therefore an object of the present invention to provide a Digital Item definition model with accuracy, flexibility, consistency and compatibility required for the electronic commercial transaction in electronic commercial transaction environment including different subjects (users), networks, terminals, etc.

Particularly, the present invention suggests Digital Item definition model with flexibility, consistency, and compatibility and a method of generating the same, which is capable of minimizing a possible disturbance in the electronic commercial transaction among all subjects associated with electronic commercial user-electronic commercial transaction business model and accomplishing under a consistent rule a compatible electronic commercial transaction for multimedia data among all subjects associated with the electronic commercial business model.

[CONSTITUTION AND OPERATION OF THE INVENTION]

To achieve the above objects and other advantages, there is provided a method of generating Digital Item for electronic commercial transaction comprising the steps of: selecting resources for the electronic commercial transaction of multimedia data; and generating Digital Item as the unit of manipulation of electronic commercial transaction for a corresponding multimedia resource defined to include anchor, descriptor, opCondition, murCondition, eventReport, userPreference, and reservedMetadata.

Here, it is preferable that the Digital Item includes lowest atomic Digital Item which is not divided any longer and packaged Digital Item, each item configuring a recurrent layered structure for each level.

Also, it is preferable that the packaged Digital Item is defined to include atomic Digital Item and/or packaged Digital Item or anchor for designating them.

Additionally, in order to configure the recurrent layered structure, it is preferable that the atomic Digital Item as lowest layer is defined as component, packaged Digital Item as middle layer including the component or the packaged Digital Item or information (anchor) for designating them is defined as item, and packaged Digital Item

as highest layer including item or container or information (anchor) for designating them is defined as container.

Preferably, when Digital Item configures a recurrent layered structure, higher level of packaged Digital Item is defined to include both of same level of packaged Digital Item and lower level of item or include anchor for designating the Digital Item.

The present invention now will be described more fully hereinafter with reference to the accompanying drawings, in which preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those having skill in the art.

Fig. 1 is a view showing a data structure of Digital Item definition model according to the present invention, Fig. 2 is a view representing Digital Item definition model of the present invention as EBNF, and Fig. 3 is a view showing one example of component elements of Digital Items according to the present invention.

As shown in Fig. 1, Digital Items of the present invention are divided into atomic Digital Item and packaged Digital Item.

The atomic Digital Item is basic Digital Item which is not divided any longer and the packaged Digital Item is configured to include the atomic Digital Item or packaged Digital Item or anchors designating each of items.

Since the packaged Digital Item has a recurrent layered configuration, it can be extended over two levels and the configuration and number of the layer have no limitation.

However, as shown in Fig. 1, the Digital Item definition model can be defined as three levels of layered configuration including container of highest layer, item of middle layer and component of lowest layer, in consideration of practical use.

Referring to Fig. 1, a structure of the Digital Item definition model of the present invention will be described.

Digital Item 100 consists of content 100a and metadata 100b. Digital Item of lowest layer which is not divided any longer is defined as atomic Digital Item 101 in the present invention. Atomic Digital Item 101 consists of atomic content 101a and metadata 101b.

Content 101a corresponds to multimedia resource and metadata 101b is data for defining and describing multimedia resource as the minimal unit capable of be manipulated in activities for the electronic commercial transaction.

Component 102 is defined to include content 101a and metadata 101b, configures lowest layer in recurrent layered structure which will be described below, and will be used as data of the minimal unit in activities of the electronic commercial transaction.

Component 102 is defined to include the following elements: multimedia resource 102a such as audio, video, image, and graphic, anchor 102b designating these resource, descriptor 102c, opCondition 102d, murCondition 102e, eventReport 102f, userPreference 102g, and reservedMetadata 102h.

Fig. 3 is a view showing one example of component elements of Digital Item definition model according to the present invention. Referring to exemplary use of component elements of Fig. 3, detailed description will be given below.

First, anchor 102b at component level designates atomic resource 102a and is defined as a reference being an identifier designating uniquely atomic resource, a descriptor describing what this particular anchor is, and an opCondition capable of describing usage format (or protocol) of anchor. Namely, anchor 102a is meant to include the reference, the descriptor and the opCondition.

Referring to component element 200a and description content 200b represented by component element 200a as shown in Fig. 3, resource 201a is Kenny G_White Christmas. mp3 file 201b and an identifier of anchor 202a is URL 202B designating the resource.

In addition, descriptor 102c at component level is description on details of

resource 102a, opCondition 102d is description on operational use conditions of resource 102a, and murCondition 102e is description on conditions for management and use rule.

Referring to component element 200a and description content 200b represented by component element 200a as shown in Fig. 3, descriptor 203a is description on the content 203b (title, type, writer, performer, etc.) of resource 201a. In addition, murCondition 204a is description on conditions 204b for management and use rule (update date, use rule, use fee...) of resource 201a and opCondition 205a is description on operational conditions 205b such as transmission rate and sampling rate.

In addition, eventReport 102f is description on event to be reported in connection with resource 201b and userPreference 102g has user preference information on resource 201a.

Referring to component element 200a and description content 200b represented by component element 200a as shown in Fig. 3, eventReport 206a is description on event 206b such as transaction success rate, access frequency, and average delivery time to be reported in connection with the resource, and userPreference 207a has information related to user preference and the like on the resource.

In addition, reservedMetadata 102h at component level is element for defining metadata additionally required for Digital Item definition model in the future.

Component 102, which is atomic item as the unit of manipulation of Digital Item according to the present invention as described above, includes multimedia resource 102a, anchor 102b for designating the resource, descriptor 102c for describing the content of the resource, opCondition 102d for describing operational use conditions of the resource, murCondition 102e for describing conditions related to commercial management and use rule for the resource, eventReport 102f for describing event to be reported in connection with the resource, userPreference 102g having user preference information 102g, and reservedMetadata 102h additionally required for Digital Item definition model in the future. Component configured as described above allows

unified, consistent and flexible manipulation among the subjects of the electronic commercial transaction with minimal manipulation unit of digital multimedia data in activities related to the electronic commercial transaction.

The component of the present invention is placed on lowest layer when Digital Item definition model has a layered structure and package Digital Item is defined in layers higher than the lowest layer.

In addition, Fig. 1 shows the Digital Item definition model constituting three levels of layered structure, item being packaged Digital Item formed as combination of item and component and container being packaged Digital Item formed as combination item and component are shown.

Packaged Digital Item 103 of middle layer in three levels of Digital Item definition model consists of packaged content 103a and metadata 103b and is defined as item 104 in the present invention.

In addition, packaged Digital Item 105 of highest layer in three levels of Digital Item definition model consists of packaged content 105a and metadata 105b and is defined as container 106 in the present invention.

First, item 104 in Digital Item definition model includes component or other items 104a as packaged content, choice 104b, descriptor 104c, murCondition 104d, eventReport 104e, userPreference 104f, and reservedMetadata 104g.

Here, packaged content 104a can include component, all of other items, or anchor for designating the component or items.

In item 104, choice 104b is defined to include recurrent choice with a number of 0 or higher, descriptor, opCondition, and selection as the object of selection. Choice 104b is used for item 104 level required for selective configuration satisfying a request of user of Digital Item. Since the user generally configures item through multi-step and so layered definition of choice is required, this choice is modeled in a recurrent form. In item 104, descriptor 104c describes the content of the packaged content 104a and murCondition 104d describes conditions related to management and use rule of the

packaged content 104a.

In item 104, eventReport 104e is description on event to be reported in connection with the packaged content 104a, userPreference 104f describes information on user preference for the packaged content 104a, and reservedMetadata 104g is element for defining metadata additionally required for Digital Item definition model in the future.

Since item 104 with the structure as described above can be connected again recurrently to higher layer of container 106, item 104 can be used to configure layered structure of the Digital Item definition model.

As three levels of the Digital Item definition model are described in the example of Fig. 1, container 106 defined as highest layer will be now described.

Container 106 includes container 106a or anchor for designating the container 106a, and item 106b or anchor for designating lower level of the item 106b. Also, container 106 includes descriptor 106c for describing packaged content 106a and 106b, murCondition 106d for describing management and use rule for packaged content 106a and 106b, eventReport 106e for describing event to be reported in connection with packaged content 106a and 106b, userPreference 106f for packaged content 106a and 106b, and reservedMetadata 106g for defining metadata additionally required for Digital Item definition model in the future.

In the meantime, component 102, item 104 and container 106 can be stored in a repository 107 along with corresponding multimedia resource.

According to Digital Item definition model as shown in Fig. 1, the subjects of electronic commercial transaction can perform activities associated with the electronic commercial transaction including creation, mining, transaction, transfer, management, storage, consumption, etc., of multimedia data, with consistency, regularity and flexibility.

Fig. 2 shows a more detailed linguistic representation of three levels of Digital Item definition model with recurrent and layered structure illustrated in Fig. 1 by use of EBNF (Extended Backus-Naur Form).

Digital Item definition model of the present invention as shown in Fig. 2 shows in an implicit and more detailed way the Digital Item structure of the present invention illustrated in Figs. 1 and 2.

In Fig. 2, '*' means at least zero(0) or more, '+' means at least one(1) or more, and ' | ' means 'OR' condition.

As represented in Fig. 2, container 106 which is highest layer of Digital Item in the present invention includes the following elements: at least zero(0) or more container 106a or anchor for designating the container 106a; at least zero(0) or more item 106b or anchor for designating lower level of the item 106b; at least zero(0) or more descriptor 106c, murCondition 106d, eventReport 106e, userPreference 106f, and reservedMetadata 106g.

Item 104 with level lower than that of container includes the following elements: at least one (1) or more component or item 104a or anchors for designating the component or item 104a; and at least zero(0) or more choice 104b, descriptor 104c, murCondition 104d, eventReport 104e, userPreference 104f, and reservedMetadata 104g.

In addition, component 102 as atomic Digital Item with level lower than that of item 104 includes the following elements: atomic resource 102a, and anchor 102b for designating the resource; and at least zero(0) or more descriptor 102c, opCondition 102d, murCondition 102e, eventReport 102f, userPreference 102g, and reservedMetadata 102h.

Here, the resource is multimedia data such as audio, video, image, text, graphic, etc.

In Digital Item of this component level, opCondition 102d which is operational use conditions of component is modeled unlike Digital Items of other levels. Here, since component corresponds to atom constituting item or Digital Item of container and so opCondition defined in component succeeds to definition of higher level of Digital Item, opCondition need not be defined separately in level higher than that of component.

Anchor 102b at component level designates resource. Also, since higher level of packaged Digital Item at item or container level can include both of same level of packaged Digital Item and lower level of item or include anchor for designating the items, higher level of anchors 104a, 106a and 106b as described above can designate Digital Item required to define each of Digital Items at item or container level.

Accordingly, in the light of Fig. 2, anchor is defined to include reference being an identifier for designating uniquely atomic resource and each of Digital Items, at least zero(0) or more descriptor (describing what this anchor is), and at least zero(0) or more opCondition capable of describing usage format (or protocol) of anchor.

Descriptor (102c, 104c, 106c, etc.) used in all Digital Items (component, item, container) as described above, choice which will be described below, selection, eventReport, userPreference, reservedMetadata, and anchor, is defined to include at least zero(0) or more existing descriptor or anchor, component capable of representing the content of descriptor or statement of text format for describing the content of descriptor to be defined, and at least zero(0) or more opCondition (for example, representation format) of descriptor.

In addition, choice used only in item (104) level of Digital Item definition level is defined to recurrent form of at least zero(0) or more choice, at least zero(0) or more descriptor, at least zero(0) or more opCondition, and at least one(1) or more selection as the object of selection.

This choice is used for item 104 level required for selective configuration satisfying a request of user of Digital Item. Since the user generally configures item through multi-step and so layered definition of choice is required, this choice is modeled in a recurrent form.

Also, opCondition in choice can be used to determine whether a single selection is selected (i.e., exclusive) or more than one selection are selected (i.e., inclusive).

Here, selection as element for defining choice is defined to include predicate as descriptive representation language, at least zero(0) or more descriptor for describing

the content of selection, and at least zero(0) or more opCondition for describing operational use conditions (for example, switching function such as use or not use for selection itself) of selection.

In the meantime, eventReport defined for event reporting which is one of important element technologies of MPEG-21 is required for providing information on event required to be reported which is generated by interaction of user and Digital Item. This information is used to evaluate and supervise general performance of multimedia framework.

Accordingly, eventReport in Digital Item definition model of the present invention is defined to include anchor for designating a server computer for processing, managing and storing the contents of event report, descriptor for describing the contents of event report, and murCondition for describing conditions related to management and use rule of event contents.

In addition, userPreference required for providing information satisfying desire of consumer who is an end user of Digital Item can provide customized information adaptable to consumer based on a result of event report and is defined to include anchor for designating the position of consumer, descriptor capable of having customized information of consumer, and murCondition capable of describing management and use rule of the information.

ReservedMetadata is defined to include anchor, and descriptor, and murCondition in the same manner as eventReport and userPreference. Since reservedMetadata is defined with reservation for extension of model in the future, this may be not used if not desired.

MurCondition is element required for defining eventReport, userPreference, and reservedMetadata, which are modeling element required by interrelation between the defined Digital Items and other users. This murCondition defines conditions for management and use rule, for example, content access authority list, recent updated data, use fee and use conditions of Digital Item to be defined or definition model

elements by use of at least one(1) or more predicate which is descriptive representation language.

In addition, opCondition for defining operational use conditions of Digital Item is required for component 102, anchor, descriptor, choice and selection among Digital Item definitions. This opCondition defines the operational use conditions by use of at least one(1) or more predicate which is descriptive representation language in the same manner as murCondition.

In the case of Digital Item of component level, opCondition includes transmission bit rate, resolution of video or image, sampling rate of audio, compression algorithm, key or decoding conditions if coded, transmission protocol, etc.

As described above, the present invention provides Digital Item definition model with regularity, flexibility, consistency and compatibility, considering at maximum all users of electronic commercial transaction business model and interrelation between primary element technologies of MPEG-21 framework and Digital Item definition model.

For example, for objective and role of monitor service provider of electronic commercial transaction, Digital Item definition model includes eventReport defined for event reporting which is one of primary element technologies of MPEG-21 and userPreference required for providing information satisfying a desire of consumer who is end user of Digital Item.

In addition, the present invention provides modeling related to multi-conditions, which is divided into various conditions dependent on objective, as well as one conditions when conditions related to operation, management, use and manipulation of Digital Item is given.

For example, operational conditions (for example, conditions for transmission bit rate, resolution, format, etc. of Digital Item) of Digital Item is modeled as opCondition and management and use conditions (for example, change history, use fee, use conditions) is modeled as murCondition, so that facility of management and maintenance can be improved at the time of use, management, manipulation according

to definition of Digital Item.

In addition, when each level of Digital Item is defined in the present invention, facility of management and maintenance can be improved by avoiding repetitive description and definition of existing Digital Item as well as definition by each Digital Item's own resource. Namely, the present invention provides model capable of giving a unique identifier to each level of Digital Item.

For example, each Digital Item can be defined by an element in model called anchor functioning as a unique identifier for container, item and component which are a layered level of Digital Item. Also, atomic component provides anchor for designating resource in the atomic component in the present invention.

In addition, the present invention suggests choice element having function of selection required for generating item desired by user when a new item is created using component and item at item level. Particularly, this choice is defined so that it can be modeled in a layered form dependent on the order of selection in order to preventing an unnecessary next selection by having next selection affected by current selection (choice ::=choice*selection+...).

For example, if price and transmission rate are used as conditions of selection for any Digital Item, an unnecessary next selection is prevented by modeling in a layered form dependent on the order of selection in a way of finding item satisfying conditions of transmission rate for item satisfying conditions of price.

The foregoing embodiments and advantages are merely exemplary and are not to be construed as limiting the present invention. The present teaching can be readily applied to other types of apparatuses. The description of the present invention is intended to be illustrative, and not to limit the scope of the claims. Many alternatives, modifications, and variations will be apparent to those skilled in the art. In the claims, means-plus-function clauses are intended to cover the structures described herein as performing the recited function and not only structural equivalents but also equivalent structures.

[EFFECT OF THE INVENTION]

The present invention provides Digital Item definition model with accuracy, flexibility, consistency, extensity and compatibility required in activities of electronic commercial transaction, under electronic commercial transaction environments being developed variously and complicatedly and conditions of network and device (or terminal) used broadly in different forms. As a result, the present invention can minimize a possible disturbance of electronic commercial transaction among electronic commercial transaction users (Digital Item creator, provider, distributor, consumer, patent exerciser, financial service provider, commercial supervisor, etc.).

In addition, considering at maximum role relations among all users of the electronic commercial transaction business models, the present invention provides a infrastructure capable of achieving a compatibility with an international standard by sufficiently considering interrelation with primary element technologies derived from PEG-21 in ISO/IEC SC29/WG11.

In addition, the present invention is very efficient and practical since it is applicable to any type of multimedia data by providing consistent Digital Item definition system.

In addition, the present invention is applicable to a broad field such as Internet service, satellite communication, electronic media (DVD, PDR, etc.) related to electronic commercial transaction, mobile communication, electronic libraries, electronic photograph studios, electronic museums, etc., to be used broadly in the future.